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ABSTRACT

Since distance learning via computer/modem is a relatively new concept, little is known about the students in computer/modem classes. This paper investigated computer/modem college students' backgrounds, ages, interests, reasons for enrollment, grades, and course completion rates as compared to traditional students. In the study there were 167 students in 8 sections of computer/modem English and Marketing at Cuyahoga Community College, Cleveland, Ohio, for the spring, summer, fall, and winter 1990-92 quarters. Instruction was solely via computer/modem through an electronic bulletin board. Statistics on the 127 students who responded to the questionnaire revealed that neither distance from campus nor time of day influenced their interaction and instruction. The typical student was female, unmarried, and native born. A large number (41%) had a grade point average above 2.5. Most (56%) had successfully completed 20 quarter hours or more. A large group (43%) were in transfer programs, worked, and attended college part time. Many (46%) were non-white. The largest group (62%) accessed their computer/modem from home and had some prior computer experience. A copy of the questionnaire is provided and 17 tables display the data. (Contains 30 references.) (Author/ALF)

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# DISTANCE LEARNING:
# A STUDY OF COMPUTER MODEM STUDENTS

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22 April 1992

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## Abstract

Distance Learning: A Study of

Computer/Modem Students

Since distance learning via computer/modem is a relatively new concept, little is known about the students in computer/modem classes. This paper investigated computer/modem students' backgrounds, ages, interests, reasons for enrollment, grades, and course completion rates as compared to traditional students'. There were 167 students in eight sections of computer/modem English and Marketing at Cuyahoga Community College, Cleveland, Ohio, for the Spring, Summer, Fall, and Winter 1990-92 quarters. Instruction was solely via computer/modem through an electronic bulletin board. Statistics on the 127 students who responded to a questionnaire revealed that neither distance from campus nor time of day influenced students' interaction and instruction. The typical student was female, unmarried, and native born. A large number (41 percent) had a Grade Point Average above 2.5. Most (56 percent) had successfully completed 20 quarter credit hours or more. The largest group (43 percent) were in transfer programs, worked, and attended college part time. Many (46 percent) were non-white. The largest group (62 percent) accessed their computer/modem from home and had some prior computer experience.

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# Chapter 1: The Problem

## Introduction

The purpose of this research is to explore a relatively new method of educational instruction in what has come to be called distance education. This new area is instruction via computer/modem. During the Spring, Summer, Fall, and Winter Quarters 1990-92, circa 167 students enrolled in eight sections of Marketing and English at Cuyahoga Community College, Cleveland, Ohio. Instruction was solely via computer/modem through an electronic bulletin board (BBS). Using IBM compatible computers, students working at home or from offices called the College's BBS. Students downloaded assignments from the BBS and uploaded completed homework at their leisure. The BBS' Conference capabilities were utilized as a form of class discussion on topics germane to the class. Neither distance from the campus or time of day were a factor in the interaction and instruction.

## Problem

Little is known about the student population in computer/modem classes. This research, as it pertains to higher education, will enable us to better understand

who these individual are, their backgrounds, age, interests, enrollment reasons, grades, and completion rate as compared to traditional students enrolled on campus, and viewed against each other. Computer/modem classes are a growing area of interest and increasing student enrollment. Since it already has a large niche market segment on both the East and West coasts of the United States, it is important for us in the Mid-West, where these course offerings are in their infancy, to learn all possible so that we might better serve our own students.

This project focused upon three areas: the nature of computer/modem students, a comparison of computer/modem students to students who take classes on campus, and a comparison of variables for computer/modem students.

First, the study explored the nature of the computer modem students in terms of age, sex, race, marital status, computer literacy, and employment. This information was collected to learn more about the general nature of the computer/modem student.

Second, on-campus students were compared to computer/modem students on the basis of certain variables, such as final grade achievement, course

completion rate, full-time part-time status, ethnic background, age, and sex. The purpose of this research was to understand how computer modem students compared to on-campus students. See hypotheses 35-41.

Third, certain variables for computer/modem students including number of e-mail messages, number of minutes logged on the system, use of a computer/modem at home or other location, final grade, and completion rate were studied. The purpose of this research was to understand factors which might have led to student success in the computer/modem classes. See hypotheses 1-34.

## Significance of the Study

Up to this point little, if any has been written about the nature of the computer/modem student and how this student compares to students who take on-campus classes.

Information is necessary for several reasons; First, a knowledge of the students will enable administrators to gear new courses and tailor existing courses toward the computer/modem students. Second, a knowledge of the students will enable instructors to better serve this group. Third, since this is a new technology, information

must be gathered to make decisions on the future of the project. Four, a knowledge of retention factors will be helpful to faculty and to administrators.

The study, then, will have national implications for education. Computer/modem classes are an answer for diverse populations, such as students who must commute long distances, handicapped individuals, students with poor transportation, incarcerated persons, individuals whose family responsibilities will not allow for travel, people whose work schedules preclude regular class attendance, and others. Thus, in an era of uncertain enrollments and other exegencies, proven strategies to deliver education to these groups, will prove beneficial to students and to the institution.

This project identified computer/modem students' preferences, motives, goals, and objectives to discover more about community college students who were enrolled in computer/modem classes, the reasons they enroll in an urban environment over traditional classes, and why the individuals who drop computer/modem classes do so. Correlations between student characteristics and course outcomes will also be explored for future use.

## Design

This is a descriptive study of individuals with various characteristics, such as, sex, age, marital status, computer experience, computer location, employment, and so on which are described in the hypothesis and correlated to students' success.

Null hypotheses were measured by the Pearson product moment correlation (Pearson r) which according to Wilson (1978) measures the degree of strength among two or more variables. The correlation coefficient is a statistical measure of strength. The data was recorded and analyzed with the Business MyStat Statistical software package.

## Selection of Subjects

Students in the experimental group were enrolled in computer/modem Marketing 201, English 101, or English 102 at Cuyahoga Community College. The control group consisted of the same number of students enrolled in like traditional classes on the same campus. For purposes of this study, a student who was taking a computer modem class and an on-campus class was eliminated from the research.

# Chapter 2: Review of The Literature

## History

The subject Distance Education includes such methods of instruction as correspondence, home study, television courses offered both locally and nationally through the Public Broadcasting System, extension classes, video conferences, and computer/modem-based distance learning. One of the earliest distance learning advertisements described by Verduin and Clark (1991) appeared in the March 20, 1728, Boston Gazette and offered shorthand lessons by mail. They further credit Isaac Pitman as the first distance educator of modern times. In 1840, he began teaching shorthand by correspondence in Bath, England. The new method of study appealed to indiyiduals who were working and required a method of learning that would not conflict with their employment. Dinsdale (1953) states that students copied Bible passages using shorthand and returned them to Pitman for grading utilizing the new penny postal system. The popularity was such that within a few years Pitman was employing a staff for grading purposes. Although correspondence was still important, by the 1930's radio began to make its presence known.

Radio Delivery

Engel (1936) cites the University of Wisconsin as the site of the first federally licensed radio station which became WHA and was devoted to educational broadcasting. Koenig and Hill (1967) credit the origination of educational television broadcasting to the University of Iowa's station W9XK between 1932 and 1937.

Distance learning continued its growth with various educational transmissions via the airwaves. As its popularity increased it became desirable to establish standards for distance education. Hence Garrison and Shale (1987) and Keegan (1986)set about to establish benchmarks.

Standards/Methods of Delivery

Garrison & Shale (1987) describe distance learning using a set of criteria against which educational activities are compared. They use the following guidelines to distinguish distance education:

-Distance education implies that the majority of educational communication between (among) teachers and students takes place noncontiguously.

-Distance education must involve two-way communication between (among) teacher and students for the purpose of facilitating and supporting the educational process.

-Distance education uses technology to mediate the necessary two-way communication.

The usual view of distance education is that it evolved from correspondence education that began with Issac Pitman. If so, it would be defined by the criteria associated with correspondence education provided by Keegan (1986). Keegan listed the following as a result of his research.

-the quasi-permanent separation of teacher and learner;
-the influence of an educational organization both in the planning and preparation of learning materials and in the provision of student

support services;

-the use of technical media to unite teacher and learner and to carry the course content;

-the provision for two way communication so that the student may benefit from or initiate dialogue;

-the quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and not in groups, with the possibility of occasional meetings for didactic and socialization purposes.

Keegan (1986) further noted two socio-cultural determinants which are both necessary pre-conditions and necessary consequences of distance education:

-the presence of more industrialized features than in conventional oral education.

-the privatization of institutional learning.

While distance education does not preclude conventional person-to-person contacts, the assumption is that an educational experience does require two way contact between student and teacher. This does not preclude individuals from suddenly believing that a new commodity has been readied for market.

Consequently, Garrison & Shale (1990) state that many individuals consider distance education as an industrialized form of education to be packaged, distributed, and consumed by the (learner) student. It should be possible to produce course materials so effective that face-to-face contact would only be in remedial situations or as a final control procedure for the problem student. This issue was a point of discussion during the development of the British Open University and Canada's Athabasca University, both of which are strongly committed to distance education.

Garrison & Shale (1990) further point out that this view would reduce instruction to packaging knowledge, teaching to selling, and learning to the consumption of packaged knowledge. From that point, it is easy to view the teacher as a utility, a resource to be used and dispensed with. The teacher can exist as a product and students need only partake of the package to become educated. This is why there is disagreement on the role of the teacher in distance education.

The concept of distance learning continued to grow and increase in popularity. Verduin and Clark (1991) noted that the Educational Resources Information Center (ERIC) did not begin to use distance education as a

descriptor until 1983. They further state that American academics often tend to equate distance education with correspondence study or with the Open University of the United Kingdom (OUUK), a large-scale distance teaching university (DTU) that used an instructionally designed multimedia approach and includes radio, television, correspondence, audio/video tapes, and computer/modem. These forms of instruction are used in combination with local tutors/mentors to encourage student' continuance.

Degree Programs

Among the earliest to offer degree programs through the use of computer/modem courses was the New York Institute of Technology. Courses offered through its American Open University, utilize text materials, course outlines, and assignments. Slotnick (1988) states that a software package called Psychware was developed at NYIT for use in introductory psychology courses and offers simulations, tutorials, and games. These materials are mailed to students who communicate with faculty and other students through computer/modem usage. Degrees are offered by NYIT in general studies, business administration, and behavioral science. As the idea of the computer as an educational tool grew, the private sector viewed this area of education as a business

opportunity.

Verduin and Clark (1991) mention TeleLearning System, a for profit business, which owns the Electronic University and acts as a clearinghouse for computer courses offered by various colleges and universities. They provide some courses on floppy disks while others are offered on-line. Students and faculty converse using both computer/modems and electronic mail. Bachelor's degrees can be earned from Regents College and Empire State in New York in addition to others. Among the facilities available are on-line libraries and information data bases. Although available, these could be expensive to use depending on the cost of computer/modem transmission.

Educational Audience

The computer/modem area of distance learning traces its roots back to correspondence education, through television course offerings and other educational media delivery but is in reality a new media of its own. Its method of delivery and interaction, its audience, and its supporters are still growing and evolving. It is dynamic,young, new and exciting. Most important, it is not to be confused with other, older, methods of

educational delivery. Computer/modem classes are particularly well suited to serving certain audiences including:

-Those in rural areas without easy access to postsecondary education.
-Reserve and active military personnel.
-The unemployed and underemployed.
-Those seeking new skills for employment advancement.
-Retirees.
-Those whose employment requires frequent or extensive travel.
-Injured, disabled, or recovering individuals.
-Those who find it impossible to attend regular campus based classes for various reasons.

In serving one portion of the handicapped audience, Coombs (1990), a blind professor of history at the Rochester Institute of Technology, states that the new computer and communication technology is ideal for providing educational access to the disabled. Although urban based disabled students face difficulty in gaining access to educational opportunities, the lack of transportation access makes it even more difficult for

the rural disabled or handicapped. Coombs further states that the only modification required for the blind in distance learning classes is the inclusion of a voice synthesizer which enables the blind to hear the class conversation rather than read it on the CRT.

Since it is difficult for military and the rural population to attend regular classes, computer/modem learning accommodates another segment of the audience. Harasim (1990) noted that on-line (computer/modem) education is a new form of education that offers the convenience of time and place independence while offering an interactive and social learning environment. This is accomplished with the use of computer software designed to facilitate conferencing and installed on a host computer/modem. To gain access to the computer conference, students must have access to a computer, a modem, and communication software. This will enable students to link with a computer that supports all of the activities that a typical college classroom provides. Included is the ability of students to send and receive messages, exchange ideas, and raise questions they wish to share with other students and faculty. This brings to distant audiences the closeness of the traditional classroom.

In addition to the computer education traveling great distances, it also allows the its audience the specific time needed for each individual to think and grow. Lauzon (1990) listed the benefits of on-line education as the facilitation of equality among members of the learning community; students have as much time on the system as they need without infringing on the rights of other members of the community; learners focus on the content of the message rather than the person presenting it; participants can either respond to material immediately or can consider it over time and send a more formal answer; it facilitates many-to-many patterns of communication rather than the normal instructor/student patterns; it provides a learning environment; it encourages cooperation and collaboration rather than competition. The benefits contribute to a learning environment which nurtures a deep level of understanding and performance.

At present, the United States does not have an institution of higher learning that was established solely for the teaching of distance students, such as the Open University of the United Kingdom. Distance education facilities for higher education have been opened in other parts of the world where education is either restricted or not as well developed. Canada

established Athabasca University, Athabasca, Alberta, as a traditional campus based institution in the 1960's; it was reorganized as a distance teaching university in 1978. Bachelor's degrees can be obtained in liberal arts and administrative science via computer/modem without ever visiting the campus. Students use both toll free and reduced cost telephone services to access the university. Shale (1984) states that Athabasca University has 10,000 students enrolled in various course offerings. This supports the idea of a need for computer/modem distance learning offerings.

Not only do students enroll in these distance learning courses but Roberts (1991) notes that the attrition rate is considerably lower. The computer/modem classes at the American Open University (New York Institute of Technology), which began offering computer/modem courses eight years ago, is 10-15 percent. This compares to the 50-80 percent drop out rate ordinarily found in traditional distance learning offerings such as television or correspondence.

Research in Distance Education (October, 1991) states that Canadian students enrolled in distance education classes may join Distance Education Students of Canada, a national network of distance education

students that provides mutual support to improve the distance education experience and make distance education more widely known throughout the Dominion. As this and other groups make their position known, perhaps it will expand the field of distance learning.

Advantages to Utilization

Turoff, writing in Harasim (1990) states that computer/modem delivery of education will, in the future, have the same citizen utilization as the telephone does today. She further outlines some of the advantages listed:

-Students and faculty do not have to meet at the same time. Instruction is available at any time of the day or night, seven days a week; the computer stores all lessons and communications until called upon.

-It is easy for students to communicate with one another to enhance the learning process.

-Distance is no barrier; students any place in the world can still be a part of a single class. Faculty can also be in any location yet be accessible to students.

-The technology is less expensive than video or telephone conferencing for providing communications. As an example, students in New Jersey can logon to an educational network

using the Virtual Classroom facilities at a charge of $2.00 per hour. This is substantially less than the cost of long distance telephone service.

Turoff further notes that the most serious bottleneck to the introduction of on-line technology in colleges and universities is not the technology, its costs, or the acceptability of students; it is the retraining and adaptability of faculty and the acceptance by administrators who are afraid of change because of the uncertainty it brings. Methods of distance communication and distance instruction are different from the typical classroom face-to-face presentation. These factors may lead to a reluctance to travel the unknown.

Lauzon (1991) observed that the instructor using computer/modem conferencing, facilitates discussion by asking students to answer questions. By responding to other students, by analyzing case studies, by reflecting and sharing the insights they have developed as a result of presenting and receiving various questions and concepts, results in personal and professional growth.

As Davie (1988) points out, one of the advantages of a computer conference is that the medium provides a

complete transcript of course interactions. Not only is the main discussion reproduced for further analysis, but each of the small groups or individuals is available. Among the possible areas of examination of a computer conference include:

-The number of contributions by each participant.
-The number of student replies to other participants.
-The time each response was entered into the system.
-The number of entries into the system.
-The length of time each student spends on the system.
-The number of student communications with each instructor.

Instructional Materials

Text materials for this type of instruction needs to be designed for the students and medium of communication. Mouli & Ramakrishna (1991) discuss readability of distance education course materials. They noted the following qualities that would enhance and encourage student learning.

-Study objectives which indicate to the student what he may expect to learn.
-An attempt to keep the student's interest through comments and discussion of relevant materials.

-Interesting and informative assignments.

-Prompt feedback to questions and assignments.

-Use of introductions and conclusions.

-Arrangement of materials and assignments so that concepts and ideas flow naturally into each other.

An appropriate level of readability of materials. By addressing the preceding points, educational materials can be developed that will enhance the students' learning experience.

Lewis (1981) suggests that student interest may be improved by writing in a lively and clear style and by attempting to relate new concepts to the students' experience. Additionally, Perry & Rumble (1987) suggest that draft materials be checked and rechecked for errors of fact, lack of clarity, poor logic, and grammatical errors in order to enhance readability for distance learning students.

## Summary

As developed in the preceding pages, the need for distance education is relevant. However, Roberts (1991) states that online computer/modem programs will not

replace traditional classroom education due to the face to face interaction. Computer/modem education is seen by some as an alternative for those individuals who cannot for various reasons attend traditional campus classes.

In addition to causing the faculty and students to become more computer literate, computer/modem education has induced colleges and universities to explore alternate methods of educational delivery. It has opened additional opportunities for those students who believed they could not obtain advanced education due to distance, health, employment, handicap, military service, irregular hours, and family responsibilities. As colleges and universities explore these new markets for students, they may find a new and largely untapped market awaiting.

# Chapter 3: Procedures

## Overview

Hypotheses were developed to test the various significant relationships between individuals who enrolled in English 101, English 102, and Marketing 201 in a traditional classroom setting as compared to a computer/modem course. The definition of terms was developed to simplify the language used throughout the study. The terms describe common computer related activities.

## Null Hypotheses

For purposes of this study, a significant difference is a a correlation of .178 which is considered significant at the .05 level.

The following Null hypotheses deal with computer/modem students and certain variables. Hypotheses were measured by means of the Pearson r.

1HO: There is no significant relationship between age and computer literacy among students enrolled in computer/modem classes.

2HO: There is no significant relationship between age and number of computer logons among students enrolled in computer/modem classes.

3HO: There is no significant relationship between age and course completion rates among students enrolled in computer/modem classes.

4HO: There is no significant relationship between age and the number of minutes spent on the computer system among students enrolled in computer/modem classes.

5HO: There is no significant relationship between sex and computer literacy among students enrolled in computer/modem classes.

6HO: There is no significant relationship between sex and number of computer logons among students enrolled in computer/modem classes.

7HO: There is no significant relationship between sex and course completion rates among students enrolled in computer/modem classes.

8HO: There is no significant relationship between sex and time on the computer system among students enrolled in computer/modem classes.

9HO: There is no significant relationship between full-time and part-time students and number of computer logons among students enrolled in computer/modem classes.

10HO: There is no significant relationship between full-time and part-time students and completion rate among students enrolled in computer/modem classes.

11HO: There is no significant relationship between full-time and part-time students and time on the computer system among students enrolled in computer/modem classes.

12HO: There is no significant relationship between GPA and computer literacy among students enrolled in computer/modem classes.

13HO: There is no significant relationship between GPA and number of computer logons among students enrolled in computer/modem classes.

14HO: There is no significant relationship between GPA and completion rate among students enrolled in computer/modem classes.

15HO: There is no significant relationship between ethnic background and final grade among students enrolled in computer/modem classes.

16HO: There is no significant relationship between ethnic background and number of computer logons among students enrolled in computer/modem classes.

17HO: There is no significant relationship between ethnic background and completion rates among students enrolled in computer/modem classes.

18HO: There is no significant relationship between ethnic background and number of minutes spent on the computer system among students enrolled in computer/modem classes.

19HO: There is no significant relationship between computer literacy and final grade achieved among students enrolled in computer/modem classes.

20HO: There is no significant relationship between computer literacy and number of computer logons among students enrolled in computer/modem classes.

21HO: There is no significant relationship between computer literacy and completion rates among students enrolled in computer/modem classes.

22HO: There is no significant relationship between computer literacy and students who access computer modems at home or other locations.

23HO: There is no significant relationship between computer literacy and number of minutes spent on the computer system among students enrolled in computer/modem classes.

24HO: There is no significant relationship between students who are employed and students who are not employed and number of computer logons among students enrolled in computer/modem classes.

25HO: There is no significant relationship between students who are employed and students who are not employed and the number of minutes spent on the computer system among students enrolled in computer/modem classes.

26HO: There is no significant relationship between students' final grade and number of computer logons among students enrolled in computer/modem classes.

27HO: There is no significant relationship between students' final grade and completion rate among students enrolled in computer/modem classes.

28HO: There is no significant relationship between students' final grade and students who access the computer modem from home or other locations among students enrolled in computer/modem classes.

29HO: There is no significant relationship between students' final grade and number of minutes spent on the computer system among students enrolled in computer/ modem classes.

30HO: There is no significant relationship between students' number of computer logons and course completion rate among students enrolled in computer/modem classes.

31HO: There is no significant relationship between students' number of computer logons and students who access the computer modem from home or other locations among students enrolled in computer/modem classes.

32HO: There is no significant relationship between students' number of computer logons and the number of minutes spent on the computer system among students enrolled in computer/modem classes.

33HO: There is no significant relationship between student course completion rate and students who access the computer modem from home or other locations among students enrolled in computer/modem classes.

34HO: There is no significant relationship between students' course completion rate and number of minutes spent on the computer system among students enrolled in computer/modem classes.

35HO: There is no significant relationship between the final grades of on-campus English 101 students and English 101 computer/modem students.

36HO: There is no significant relationship between the final grades of on-campus English 102 students and English 102 computer/modem students.

37HO: There is no significant relationship between the final grades of on-campus Marketing 201 students and Marketing 201 computer/modem students.

38HO: There is no significant relationship between course completion rate for on-campus Marketing 201 students and Marketing 201 computer/modem students.

39HO: There is no significant relationship between course completion rates for on-campus students enrolled in English 101 and English 101 computer/modem students.

40HO: There is no significant relationship between course completion rates for on-campus students enrolled in English 102 and English 102 computer/modem students.

41HO: There is no significant relationship in GPA achievement between on-campus students enrolled in English 101, English 102, and Marketing 201,and English 101, and English 102, and Marketing 201 students enrolled in computer/modem classes.

Definition of Terms

Computer--Electronic machines that can store and manipulate data. IBM compatible or clone.

Modem--A modem translates whatever data is presented into sound signals that are transmitted over telephone lines to another computer which converts the signals back to the original data sent. Hays compatible 1200 or 2400 baud

Distance Learning--Educational situations where students and instructors are separated by time or space. That distance is bridged by using one or more media, frequently involving electronic technology.

Downloading--The process of taking information from one computer and sending it to another is called uploading.

Uploading--The process of sending information from one computer to another.

Computer Conferencing--This technology permits students to work together in groups, ask questions

of instructors and peers, and to share experiences through the use of a host computer. It also provides instructors with an opportunity to give small group instruction, administer examinations, provide feedback, and offer remedial tutoring.

CMC--computer mediated communication--Provides communication across distances utilizing personal computers, modems, phone lines and computer networks.

On-Line--Refers to a computer which is communicating with another computer or computers.

Telecomputing or computer communication--This describes communication between computers connected by modems and telephone lines.

Interactivity--Communication in which all parties take an active part in the activity.

Offline--Means the computers are not connected.

Electronic Mail--(e-mail)This provides communication among specific groups, and also offers individual communication between two or more persons.

On--Line Databases and Information Banks--A collection of related files immediately accessible to all who access the software.

BBS--Bulletin board services provide a means for users to post messages and to take (download) or send messages (upload) through their computers. We a presently using the program PC Board.

GPA--Grade point average refers to a student's cumulative grade point average which is the average for all classes attempted at Cuyahoga Community College.

Full-time student--Any student who enrolls in 12 or more quarter hours is considered a full-time student.

Part-time student--A student enrolled in less than 12 quarter hours is considered a part-time student.

Case-study approach--This refers to a systematic method of determining issues and solutions in a business simulation.

Data Collection and Recording

For purposes of this study, information on students' marital status, place of birth (native or non-native), and number of hours completed was collected. The information was complied to obtain a profile of computer/modem students. This information is discussed in the section Student Profile.

Data for this study was obtained from a student questionnaire, (see appendices) admission records, grade sheets, and the computer BBS. The questionnaire was given to all students enrolled in computer/modem English 101, English 102, and Marketing 201. The information was compiled using the MyStat software program with data entered for each individual response.

Data Analysis

The information obtained after inserting student' profiles on the MyStat statistical program, was analyzed with the Pearson r. It was determined that a significant difference is a correlation of .178 which is considered significant at the .05 level. The results are presented in table form in chapter 4.

## Limitations

Although Cuyahoga Community College is comprised of three separate campuses, this study was limited to three computer/modem classes conducted from the Western Campus. The number of students involved reflect those who enrolled in the courses without the benefit of substantial publicity.

## Summary

The process involved in examining the Null Hypotheses required information gathering, which began with an analysis of enrollment, admission records, grades, and BBS data. This raw data was then entered into the MyStat statistical package by individual response and correlated to determine if a significant relationship existed between variables. The study may be limited in that is took place only on the Western Campus of Cuyahoga Community College and utilized three classes.

# Chapter 4: Analysis and Evaluation

## Introduction

Out of the 167 students who were enrolled in the six computer/modem classes, there were 127 students who responded to the questionnaire.

## Findings

Table 1

| Demographics | N | Percent |
|---|---|---|
| Sex | | |
| Male | 43 | 33.8 |
| Female | 84 | 66.2 |
| Ethnic background | | |
| Non-White | 59 | 46.4 |
| White | 68 | 53.6 |
| Marital Status | | |
| Unmarried | 84 | 66.1 |
| Married | 43 | 33.9 |
| Age | | |
| 25 and under | 52 | 40.9 |
| 26 and over | 75 | 59.1 |
| Place of birth | | |
| U.S.A. | 126 | 99.2 |
| Foreign born | 1 | .8 |
| Employment status | | |
| Employed full-time or part-time? | 68 | 53.5 |
| Not Presently Employed? | 59 | 46.5 |

As noted in Table 1, the typical student who took the computer/modem classes was female (66 percent), unmarried (66 percent), and over age 26 (75 percent). Almost all of the students were native born.

Table 2

| Academics | N | Percent |
|---|---|---|
| Student Status | | |
| Full-time | 45 | 35.4 |
| Part-time | 82 | 64.6 |
| Grade point average at Cuyahoga Community College | | |
| 2.5 or Above | 52 | 41.0 |
| Below 2.5 | 75 | 59.0 |
| Quarter credit hours completed | | |
| 20 quarter credit hours or more | 72 | 56.6 |
| Fewer than 20 quarter credit hours | 55 | 43.4 |
| Home campus | | |
| Metro | 27 | 21.3 |
| East | 22 | 17.3 |
| Western | 78 | 61.4 |
| Purpose in attending Cuyahoga Community College | | |
| Obtain credit to transfer to another institution | 55 | 43.2 |
| Earn a CCC Associate Degree | 48 | 36.8 |
| Vocational program or training | 5 | 04.5 |
| Skill development-personal improvement | 13 | 10.1 |
| Other | 06 | 05.4 |

Thus, the typical computer/modem student was a part-time student (64 percent) who had taken more than 20 hours (56 percent) and many of whom (41 percent) were able to maintain a 2.5 or better grade average.

| Table 3<br>Computer/modem class data | N | Percent |
|---|---|---|
| Computer/modem class | | |
| English 101 | 71 | 55.9 |
| English 102 | 40 | 31.5 |
| Marketing 201 | 16 | 12.6 |
| Computer/Modem Location | | |
| Home | 79 | 62.2 |
| Other | 47 | 37.8 |
| Computer literacy | 44 | 34.6 |
| No prior experience before this class | | |
| Some prior computer experience | 83 | 65.4 |

As Table 3 indicates, the majority of students (55 percent) were enrolled in English 101, accessed their computer/modem from home (62 percent), and (65 percent) had some prior computer experience.

A correlation of .178 is considered statistically significant at the .05 level.

Table 4

Summary of Hypotheses

| Ho | Variables | Correlation | Significant |
|---|---|---|---|
| | Summary of Findings. | | |
| 1. | Age/computer literacy | .346 | Y |
| 2. | Age/logons | .183 | Y |
| 3. | Age/course completion | -.083 | N |
| 4. | Age/minutes spent | .012 | N |
| 5. | Sex/computer literacy | .245 | Y |
| 6. | Sex/logons | .087 | N |
| 7. | Sex/course completion | -.107 | N |
| 8. | Sex/minutes spent | .045 | N |
| 9. | Status/logons | .082 | N |
| 10. | Status/course completion | .005 | N |
| 11. | Status/minutes spent | -.032 | N |
| 12. | GPA/computer literacy | .174 | N |
| 13. | GPA/logons | .218 | Y |
| 14. | GPA/course completion | -.131 | N |
| 15. | Ethnic/final grade | .014 | N |
| 16. | Ethnic/logons | .099 | N |
| 17. | Ethnic/course completion | -.169 | N |
| 18. | Ethnic/minutes spent | .016 | N |
| 19. | Literacy/final grade | .178 | Y |
| 20. | Literacy/logons | .121 | N |
| 21. | Literacy/course completion | -.213 | Y |
| 22. | Literacy/modem access | -.158 | N |
| 23. | Literacy/minutes spent | .247 | Y |
| 24. | Employment/logons | -.029 | N |
| 25. | Employment/minutes spent | .049 | N |
| 26. | Final grade/logons | .077 | N |
| 27. | Final grade/course comp. | -.107 | N |
| 28. | Final grade/modem access | .073 | N |
| 29. | Final grade/minutes spent | -.004 | N |
| 30. | Logons/course completion | -.188 | Y |
| 31. | Logons/modem access | .182 | Y |
| 32. | Logons/minutes spent | .711 | Y |
| 33. | Course comp./modem access | -.120 | N |

| | | | |
|---|---|---|---|
| 34. | Course comp./minutes spent | -.288 | Y |

The following correlations are for computer/modem classes and on-campus classes.

| Ho | Variables | Correlation | Significant |
|---|---|---|---|
| 35. | Final grade/English 101 | .883 | Y |
| 36. | Final grade/English 102 | .921 | Y |
| 37. | Final grade/Marketing 201 | .951 | Y |
| 38. | Course comp./Marketing 201 | .907 | Y |
| 39. | Course comp./English 101 | .829 | Y |
| 40. | Course comp./English 102 | .845 | Y |
| 41. | GPA/computer-modem/on-campus | .149 | N |

Evaluation of Findings.

Null Hypotheses

For purposes of this study, a significant difference is a statistically significant difference at the .05 level. A correlation of .178 is considered statistically significant at the .05 level.

The following Null hypotheses deal with computer/modem students and certain variables. Hypotheses were measured by means of the Pearson r.

A correlation of .178 is significant at the .05 level, the level used for a significant relationship in this study.

1HO: There is no significant relationship between age and

computer literacy among students enrolled in computer/modem classes.

As seen in Table 5, the correlation between age and computer literacy was .346. Therefore, the null hypothesis was rejected.

Table 5
Computer/Modem Class: Correlations for Age

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Computer literacy | .346 | 1 | yes |
| Number of logons | .183 | 2 | yes |
| Course completion rate | -.083 | 3 | no |
| No. of minutes spent | .012 | 4 | no |

2HO: There is no significant relationship between age and number of computer logons among students enrolled in computer/modem classes.

3HO: There is no significant relationship between age and course completion rates among students enrolled in computer/modem classes.

As seen in Table 5, the relationship between age and course completion rate was -.083. Therefore, the null hypothesis was accepted.

4HO: There is no significant relationship between age and the number of minutes spent on the computer system among students' enrolled in computer/modem classes.

The correlation between age and the number of minutes spent on the computer was .012 as illustrated in Table 3. Therefore, the null hypothesis was accepted.

Table 6

Computer/Modem Class: Correlations for Sex

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Computer literacy | .245 | 5 | yes |
| Number of logons | .087 | 6 | no |
| Course completion rate | -.107 | 7 | no |
| No. of minutes spent | .045 | 8 | no |

5HO: There is no significant relationship between sex and computer literacy among students enrolled in computer/modem classes.

As demonstrated in Table 6, the relationship between sex and computer literacy was .245. Therefore, the null hypothesis was rejected.

6HO: There is no significant relationship between sex and number of computer logons among students enrolled in computer/modem classes.

The correlation between sex and number of computer logons was .245 as shown is Table 4. Therefore, the null hypothesis was accepted.

7HO: There is no significant relationship between sex and course completion rates among students enrolled in computer/modem classes.

The relationship between sex and course completion rate was -.107 as shown in Table 6. Thus, the null hypothesis was accepted.

8HO: There is no significant relationship between sex and time on the computer system among students enrolled in computer/modem classes.

As shown in Table 6, the relationship between sex and number of minutes spent on the computer was .045. Therefore, the null hypothesis was accepted.

9HO: There is no significant relationship between students' status (full-time or part-time) and the number of computer logons among students enrolled in computer/modem classes.

The correlation between students' status (full-time

part-time) and number of computer logons was .082 as illustrated in Table 7. Thus, the null hypothesis was accepted.

Table 7

Computer/Modem Class: Correlations for students' Status (Full-Time Part-Time)

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Number of logons | .082 | 9 | no |
| Course completion rate | .005 | 10 | no |
| No. of minutes spent | -.032 | 11 | no |

10HO: There is no significant relationship between full-time and part-time students and completion rate among students enrolled in computer/modem classes.

As shown in Table 7, the correlation between students' status (full-time part-time) and course completion rate was .005. Therefore, the null hypothesis was accepted.

11HO: There is no significant relationship between full-time and part-time students and time on the computer system among students enrolled in computer/modem classes.

The relationship between students' status (full-time part-time) and umber of minutes spent on the computer was -.032 as shown in Table 7. Therefore, the null hypothesis was accepted.

12HO: There is no significant relationship between GPA and computer literacy among students enrolled in computer/modem classes.

As shown in Table 8, the relationship between students' GPA and computer literacy was .174. Therefore, the null hypothesis was accepted.

Table 8

Computer/Modem Class: Correlations for Students' GPA

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Computer literacy | .174 | 12 | no |
| Number of logons | .218 | 13 | yes |
| Course completion rate | -.131 | 14 | no |

13HO: There is no significant relationship between GPA and number of computer logons among students enrolled in computer/modem classes.

The relationship between students' GPA and number of computer logons was shown in Table 8, to be .218. Thus, the null hypothesis was rejected.

14HO: There is no significant relationship between GPA and completion rate among students enrolled in computer/modem classes.

As shown in Table 8, the correlation between students' GPA and course completion rate was -.131. Therefore, the null hypothesis was accepted.

15HO: There is no significant relationship between ethnic background and final grade among students enrolled in computer/modem classes.

As shown in Table 9, the relationship between students' ethnic background and final grade received was .014. Therefore, the null hypothesis was accepted.

Table 9

Computer/Modem Class: Correlations for Students' Ethnic Background

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Final grade | .014 | 15 | no |
| Number of logons | .099 | 16 | no |
| Course completion rate | -.169 | 17 | no |
| No. of minutes spent | .016 | 18 | no |

16HO: There is no significant relationship between ethnic background and number of computer logons among students enrolled in computer/modem classes.

As illustrated in Table 9, the relationship between students' ethnic background and number of computer logons was .099. Thus, the null hypothesis was accepted.

17HO: There is no significant relationship between ethnic background and completion rates among students enrolled in computer/modem classes.

As shown in Table 9, the relationship between students' ethnic background and course completion rate was -.169. Therefore, the null hypothesis was accepted.

18HO: There is no significant relationship between ethnic background and number of minutes spent on the computer system among students enrolled in computer/modem classes.

Table 9, illustrates the relationship between students' ethnic background and the number of minutes spent on the computer as .016. Thus, the null hypothesis was accepted.

19HO: There is no significant relationship between computer literacy and final grade achieved among students enrolled in computer/modem classes.

As shown in Table 10, the relationship between students' computer literacy and final course grade was .178. Therefore, the null hypothesis was rejected.

Table 10

Computer/Modem Class: Correlations for Students' Computer Literacy

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Final grade | .178 | 19 | yes |
| Number of logons | .121 | 20 | no |
| completion rate | -.213 | 21 | yes |
| Modem access | -.158 | 22 | no |
| No. of minutes spent | .247 | 23 | yes |

20HO: There is no significant relationship between computer literacy and number of computer logons among students enrolled in computer/modem classes.

As shown in Table 10, the correlation between students' computer literacy and number of computer logons was .121. Therefore, the null hypothesis was accepted.

21HO: There is no significant relationship between computer literacy and completion rates among students enrolled in computer/modem classes.

The relationship between students' computer literacy and course completion rate was -.213 as shown in Table 10. Therefore, the null hypothesis was rejected.

22HO: There is no significant relationship between computer literacy and students who access computer modems at home or other locations.

The correlation between students' computer literacy and computer/modem access as shown in Table 10, was -.158. Thus, the null hypothesis was accepted.

23HO: There is no significant relationship between computer literacy and number of minutes spent on the computer system among students enrolled in computer/modem classes.

The relationship between students' computer literacy and the number of minutes spent on the computer was .247 as shown in Table 10. Therefore, the null hypothesis was rejected.

24HO: There is no significant relationship between students who are employed and students who are not employed and number of computer logons among students enrolled in computer/modem classes.

The correlation for students' employed or not employed and the number of computer logons as shown in Table 11, was -.029. Therefore, the null hypothesis was accepted.

Table 11

Computer/Modem Class: Correlations for Students' Employed or Not Employed

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Number of logons | -.029 | 24 | no |
| No. of minutes spent | .049 | 25 | no |

25HO: There is no significant relationship between students who are employed and students who are not employed and the number of minutes spent on the computer system among students enrolled in computer/modem classes.

The relationship between students' employed or not employed and the number of minutes spent on the computer as shown in Table 11, was .049. Thus, the null hypothesis was accepted.

26HO: There is no significant relationship between students' final grades and number of computer logons among students enrolled in computer/modem classes.

As shown in Table 12, the relationship between students' final grade and the number of computer logons was .077. Therefore, the null hypothesis was accepted.

Table 12

Computer/Modem Class: Correlations for Students' Final Grade

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| No. of logons | .077 | 26 | no |
| Completion rate | -.107 | 27 | no |
| Modem access | .073 | 28 | no |
| No. of minutes spent | -.004 | 29 | no |

27HO: There is no significant relationship between students' final grade and completion rate among students enrolled in computer/modem classes.

The relationship between students' final grade and course completion rate was -.107 as illustrated in Table 12. Therefore, the null hypothesis was accepted.

28HO: There is no significant relationship between students' final grade and students who access the computer modem from home or other locations among students enrolled in computer/modem classes.

The correlation between students' final grade and computer/modem access was shown to be .073 in Table 12. The null hypothesis was accepted.

29HO: There is no significant relationship between students' final grade and number of minutes spent on the computer system among students enrolled in computer/ modem classes.

As shown in Table 12, the relationship between students' final grade and the number of minutes spent on the computer was -.004. Therefore, the null hypothesis was accepted.

30HO: There is no significant relationship between students' number of computer logons and course completion rate among students enrolled in computer/modem classes.

As illustrated in Table 13, the relationship between students' number of computer logons and course completion rate was -.188. Thus, the null hypothesis was rejected.

Table 13

Computer/Modem Class: Correlations for Students' Number of BBS Logons

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Completion rate | -.188 | 30 | yes |
| Modem access | .182 | 31 | yes |
| No. of minutes spent | .711 | 32 | yes |

31HO: There is no significant relationship between students' number of computer logons and students who access the computer

modem from home or other locations among students enrolled in computer/modem classes.

As shown in Table 13, the correlation between students' number of computer logons and computer/modem access was .182. Therefore, the null hypothesis was rejected.

32HO: There is no significant relationship between student course completion rate and students who access the computer modem from home or other locations among students enrolled in computer/modem classes.

As illustrated in Table 13, the correlation between students' number of computer logons and the number of minutes spent on the computer was .711. Therefore, the null hypothesis was rejected.

Table 14

Computer/Modem Class: Correlations for Students' Course Completion Rate

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Modem access | -.120 | 33 | no |
| No. of minutes spent | -.288 | 34 | yes |

33HO: There is no significant relationship between student course completion rate and number of minutes spent on the computer system among students enrolled in computer/modem classes.

The relationship between students' course completion rate and computer/modem access as shown in Table 14, was shown to be -.120. Therefore, the null hypothesis was accepted.

34HO: There is no significant relationship between students' course completion rate and number of minutes spent on the computer system among students enrolled in computer/modem classes.

As illustrated in Table 14, the correlation between students' course completion rate and the number of minutes spent on the computer system was -.288. Thus, the null hypothesis was rejected.

35HO: There is no significant relationship between the final grades of on-campus English 101 students and English 101 computer/modem students.

As shown in Table 15, the correlation between final grades of computer/modem classes enrolled in English 101 and on-campus English 101 students was .883. Therefore, the null hypothesis was rejected.

Table 15

Correlations--Final Grades for Computer/Modem Classes and On-Campus Classes

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| English 101 | .883 | 35 | yes |
| English 102 | .921 | 36 | yes |
| Marketing 201 | .951 | 37 | yes |

36HO: There is no significant relationship between the final grades of on-campus English 102 students and English 102 computer/modem students.

Table 15, illustrates the correlation between final grades of computer/modem class students enrolled in English 102 and on-campus English 102 students was .921. Therefore, the null hypothesis was rejected.

37HO: There is no significant relationship between the final grades of on-campus Marketing 201 students and Marketing 201 computer/modem students.

As shown in Table 15, the correlation between final grades of Computer/modem classes enrolled in Marketing 201 and on-campus Marketing 201 students was .951. Thus, the null hypothesis was rejected.

Table 16

Correlations--Course Completion Rates for Computer/Modem Classes and On-Campus Classes

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| Marketing 201 | .907 | 38 | yes |
| English 101 | .829 | 39 | yes |
| English 102 | .845 | 40 | yes |
| Marketing 201 | .907 | 41 | yes |

38HO: There is no significant relationship between course completion rate for on-campus Marketing 201 students and Marketing 201 computer/modem students.

As illustrated in Table 16, the relationship between students' course completion rate of on-campus Marketing 201 students and Marketing 201 computer/modem students is .907. Thus,the null hypothesis was rejected.

39HO: There is no significant relationship between course completion rate for on-campus English 101 students and English 101 computer/modem students.

A correlation at the .845 level exists, as shown in Table 16, between course completion rate for on-campus English 101 students and English 101 computer/modem students.

As shown in Table 16, the correlation between students' course completion rate for on-campus English 101 students and English 101 computer/modem students is .829. Therefore, the null hypothesis was rejected.

40HO: There is no significant relationship between course completion rate for on-campus students enrolled in English 102 and English 102 computer/modem classes.

As shown in Table 16, the relationship between students' course completion rate for on-campus English 102 students and English 102 computer/modem students is .845. Therefore, the null hypothesis was rejected.

41HO: There is no significant relationship in GPA achievement between on-campus students enrolled in English 101, English 102, and Marketing 201, and students enrolled in computer/modem classes in English 101, English 102, and Marketing 201.

As shown in table 17, the data does not demonstrate a significant correlation between Grade Point Average for computer/modem students and on campus students enrolled in identical classes.

Additionally, Table 17 shows the correlation between GPA achievement of on-campus students enrolled in English 101, English 102, and Marketing 201 and students enrolled in English 101, English 102, and Marketing 201 via computer/modem classes was .149. Thus, the null hypothesis was accepted.

Table 17
Correlations--GPA for Computer/Modem Classes and On-Campus Classes

| Variable | Correlation | Ho | Significant |
|---|---|---|---|
| | On-campus classes | | |
| Computer/modem classes | .149 | 43 | no |

## Summary

Of the 167 students who were enrolled in the six computer/modem classes, there were 127 students who responded to the questionnaire.

The typical student who enrolled in the computer/modem class was female, unmarried, and native born. A large number (41 percent) had a Grade Point Average of 2.5 or above. Most (56 percent) had successfully completed 20 quarter credit hours or more. The largest group (43 percent) is striving to obtain credit to transfer to another institution while working and attending college part time. Many (46 percent) were non-white.

The largest group (62 percent) accessed their computer/modem from home and had some prior computer experience.

# Chapter 5: Conclusions And Recommendations

## Summary

During the Spring, Summer, Fall, and Winter Quarters 1991-92, circa 167 students enrolled in eight sections of computer/modem English and Marketing at Cuyahoga Community College, Cleveland, Ohio. The method of instruction was solely via computer/modem utilizing an electronic bulletin board (BBS). Students working from home or other locations using IBM compatible computers and modems phoned a College BBS. Students received assignments by downloading from the BBS at any time of the day or night and uploaded completed assignments. Student discussion was facilitated through the BBS' conference capabilities which enabled participants to exchange ideas on topics germane to the class. Typically important scheduling factors, such as time of day, work schedule, travel time, family obligations, handicap, personal limitations, incarceration, weather, and great distance from the College are not factors in student instruction or interaction.

I order to ascertain more about the student population enrolled in computer/modem classes, the investigators sent a questionnaire to 167 students who had taken the computer/modem classes. However, of the 167 questionnaires sent out only 127 questionnaires (76 percent) were returned. The Pearson r test was implemented to determine the significance at the .05 level for such variables as age, sex, computer literacy, number of computer logons, minutes spent of the system, employment, completion rate, computer literacy, final grade, GPA, modem access, and a comparison of on-campus students and computer/modem students.

## Conclusions

The results of this study provide an interesting view of the relationship between age and certain computer behaviors. The results indicate that older students tend to be more computer literate than younger students and logon to the computer more often than younger students. However, younger students have a higher course completion rate. The correlation between age and number of logons and minutes spent on the computer was not significantly in favor of the older or younger students.

Female computer/modem students tend to be more computer literate than male computer/modem students. This could be due to the employment of females in office staff positions where they work with various computer programs. However, sex was not found to be a significant factor in the number of computer logons, course completion rate, or the number of minutes actually spent on the computer.

Student status of full-time or part-time enrollment was not found to be significant with regard to number of computer logons, course completion rate, or the number of actual minutes spent on the computer.

Students' grade point average was not found to be significant with reference to computer literacy or course completion rate. However, GPA did show a relationship with the number of computer logons students initiated. This suggests that students' with higher GPA's send and receive computer messages more frequently.

No significant relationship was found for students' ethnic background (white/nonwhite) with reference to final grade, number of computer logons, course completion rate, or number of actual minutes spent on the computer.

Computer literacy was found to have a correlation with students' final grade, course completion rate, and number of minutes spent on the BBS. This is illustrated in Table 10 and could suggest that individuals who are computer literate achieve higher course grades, and spent more actual time on the computer. No significant relationship was found for number of computer logons or computer/modem access.

No significant correlation was found between final grade achieved and number of computer logons, course completion rate, computer/modem access, or actual number of minutes spent on the BBS.

The number of computer logons demonstrated a relationship as to course completion, computer/modem access, and number of minutes spent on the computer. This suggests that the number of logons has an effect on time spent on the computer and BBS. This is shown in Table 10. No significant relationship was found between student employment and the number of computer logons or the number of minutes spent on the computer. Additionally, students' final grade and number of computer logons did not correlate to a significant relationship.

As referenced in Table 12, course completion as related to computer/modem access and final grade is not shown to be significant. The number of computer logons did not show a significant relationship as to computer/modem location. However, course completion as it pertains to minutes spent on the BBS did demonstrate a correlation. A significant correlation was present in the number of computer logons and the number of minutes spent on the computer system.

As referenced in Table 15, strong correlations were demonstrated in comparisons of computer/modem classes and on-campus traditional classes in both the areas of final grade and course completion. Table 14, illustrates a significant correlation between course completion rates for computer/modem and traditional on-campus classes. A significant relationship was found, as shown in Table 14, between course completion rate and number of minutes spent on the computer.

Table 17, shows that a significant relationship was not present between students' GPA for computer/modem classes and traditional on-campus classes.

Implications

Although older students tend to logon to the BBS more often than younger students, the number of minutes each group spends on the BBS does not significantly differ. Therefore, no further action or research is necessary on this point.

Female computer/modem students tend to be more computer literate possibly as a result of employment or high school education. This might tend to provide an initial advantage in computer/modem education until males catch up through computer usage. Since computer literacy has been shown to affect final grade achievement this could be an important issue.

Grade point average in computer/modem classes has been shown to be affected by the number of computer logons indicating that the more an individual enters the BBS the more likely he or she to improve final grade achievement.

Ethnic background (white nonwhite) has not been shown to be a significant factor in final grade achievement, number of computer logons, course completion rate, or number of actual minutes spent on the computer. This demonstrates that computer/modem classes offer equal opportunity to all enrolled.

Computer literacy has been shown to affect final grade achievement number of computer logons, and number of actual minutes spent.

Typically important scheduling factors, such as time of day, work schedule, travel time, family obligations, handicap, personal limitations, incarceration, weather, and great distance from the College are not factors in student instruction or interaction. They are however, the reasons that many students enroll in computer/modem classes and cannot register for or attend traditional on-campus courses. As colleges struggle to increase or maintain enrollment with the present declining pool of college-age individuals, the scheduling flexibility of computer/modem classes will only be limited by the imagination of administrators and the number of course offerings.



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## Recommendations

More emphasis should be placed on improving student computer literacy at all levels of the College. In computer/modem classes, computer literacy provided an advantage to students who were acquainted with both, the hardware, as well as some software. Although many students acquire computer skills from their employment it might be advisable to require an initial course in computer basics for all entering students. This could be on a non-credit or credit basis.

Computer/modem classes offer an opportunity to potential students who otherwise might not be able to attend traditional on-campus classes. These include handicapped, ill, individuals who travel, whose work schedules prevent regular class attendance, individuals who must care for family members, and those who live some distance from the campus or who cannot find transportation, and the incarcerated.

Individuals who enroll must have access to a computer/modem and communications software. This has not proven to be an obstacle with computer/modem installations available at places of employment, friends, family, and Cuyahoga Community College campus

libraries. Students enrolled have demonstrated an ability to find a computer/modem in order to log on to the system and send and receive course work.

Although the sample of students, 167, was small, it was found that compared to students enrolled in traditional on-campus classes computer/modem students were typically older, had achieved a higher grade point average, obtained higher course grades, and had a lower drop rate than their traditional counterparts. They were serious about their education. Since the advent of computer/modem offerings at the College, numerous requests have been made for additional courses in other academic areas. These suggestions will be submitted to the appropriate administrative area for consideration and possible inclusion in future distance learning offerings.

Considering the brief history, and the absence of substantial research in computer/modem education, this research project has extended awareness of the enrollment implications. It is hoped this endeavor will provide the impetus needed to actively pursue this new field of educational delivery.

Questionnaire

In order to serve you, our students enrolled in Cuyahoga Community College Computer/Modem classes, we ask that you complete the survey and return it in the envelope provided. We will use the information to improve service, develop new software for the classes, expand course offerings, and make the courses more attractive and easier to access. Thank you.

DO NOT put your name on the answer sheet.

Please use a pencil to mark the answers on the blue Scan-Tron sheet.

1. Sex
   A) Male
   B) Female

2. Student Status
   A) Full-time--Enrolled in 12 credit hours or more
   B) Part-time--Enrolled in 11 credit hours or less

3. Marital Status
   A) Unmarried
   B) Married

4. Age
   A) 25 and under
   B) 26 and over

5. Place of birth
   A) U.S.A.

B) Foreign born

6. Grade point average at Cuyahoga Community College
   A) 2.5 or Above
   B) Below 2.5

7. How many quarter credit hours have you completed at CCC or elsewhere?
   A) 20 quarter credit hours or more
   B) Fewer than 20 quarter credit hours

8. What is your home campus?
   A) Metro
   B) East
   C) Western

9. Computer/Modem location
   A) Home
   B) Any Other location--work, college, friend's etc.

10. Which class did you take?
    A) English 101
    B) English 102
    C) Marketing 201

12. Purpose in attending Cuyahoga Community College
    A) Obtain credit to transfer to another institution
    B) Earn a CCC Associate Degree
    C) Vocational program or training
    D) Skill development-personal improvement
    E) Other

13. Ethnic background
    A) Non-White
    B) White

14. How do you rate your computer literacy (experience-knowledge)?
    A) No prior experience before this class
    B) Some prior computer experience

16. Please indicate your employment status
    A) Employed full-time or part-time?
    B) Not Presently Employed?

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